

Simplify

$$\textcircled{1} (x-y)(x+y) = x^2 - y^2$$

$$\textcircled{2} (x-y)(x^2 + xy + y^2) = x^3 - y^3$$

$$\textcircled{3} (x-y)(x^3 + x^2y + xy^2 + y^3) = x^4 - y^4$$

$$\frac{x^5 - y^5}{x - y} = x^4 + x^3y + x^2y^2 + xy^3 + y^4$$

$$\frac{f(x) - f(c)}{x - c} \Rightarrow \frac{x^5 - c^5}{x - c} = \frac{\cancel{(x - c)}(x^4 + x^3c + x^2c^2 + xc^3 + c^4)}{\cancel{x - c}}$$

$$\lim_{x \rightarrow c} x^4 + x^3c + x^2c^2 + xc^3 + c^4$$

$$c^4 + c^3c + c^2c^2 + c \cdot c^3 + c^4$$

$$c^4 + c^4 + c^4 + c^4 + c^4$$

$$\boxed{5c^4}$$

$$x^{10} \rightarrow 10x^9$$

$$y = x^6$$

$$y' = 6x^5$$

$$y = a^n$$

$$y' = na^{n-1}$$

$$\bullet \frac{d}{dx} c = 0$$

$$\bullet \frac{d}{dx} x^n = nx^{n-1}$$

$$\bullet \frac{d}{dx}(cu) = c \frac{du}{dx}$$

$$\bullet \frac{d}{dx}(u \pm v) = \frac{du}{dx} \pm \frac{dv}{dx}$$

$$\bullet \frac{d}{dx}(uv) = u \frac{dv}{dx} + v \frac{du}{dx}$$

$$\bullet \frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$$

Sect. 3.3 #3-39 (mult. of 3), 44, 45, 46, 47, 51